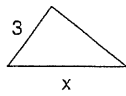
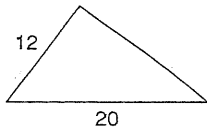


Similar Figures

Each pair of figures is similar. Find the missing side.

1)



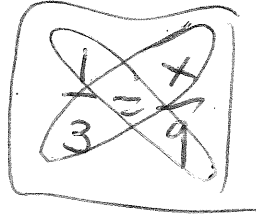
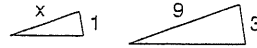
$$\frac{3}{12} = \frac{x}{20}$$

$$\frac{1}{4} = \frac{x}{20}$$

$$4x = 20$$

$$x = 5$$

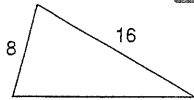
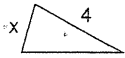
2)



$$3x = 9$$

$$x = 3$$

3)



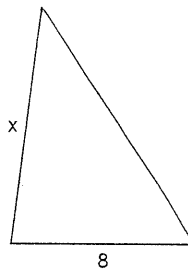
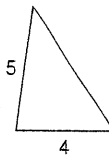
$$\frac{16}{4} = \frac{8}{x}$$

$$16x = 32$$

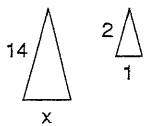
$$\frac{4}{16} = \frac{x}{8}$$

$$x = 2$$

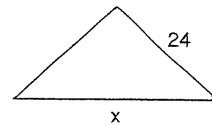
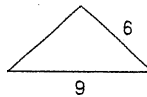
4)



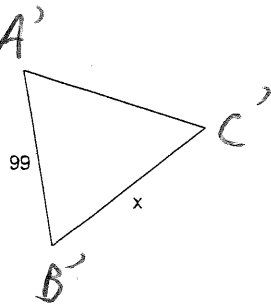
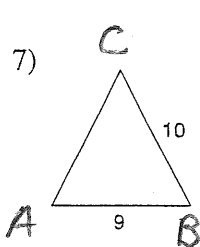
5)



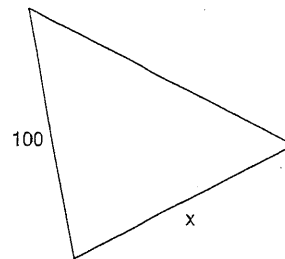
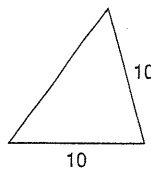
6)



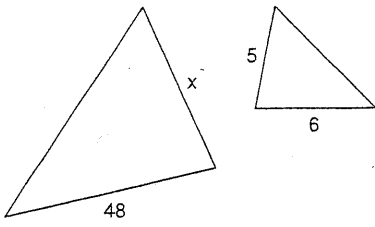
7)



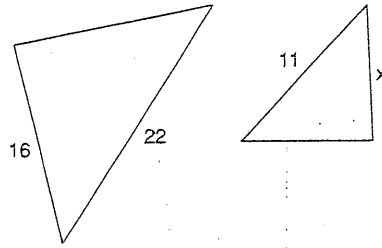
8)



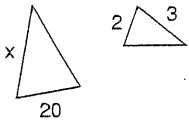
9)



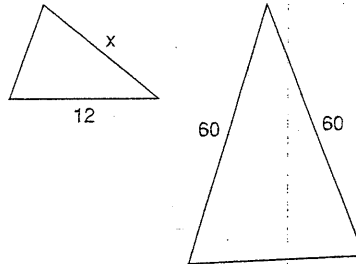
10)



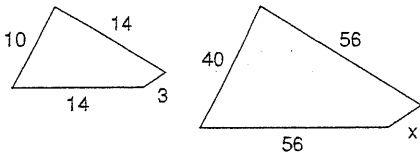
11)



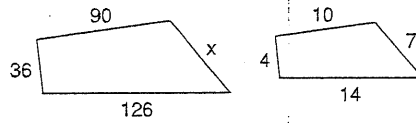
12)



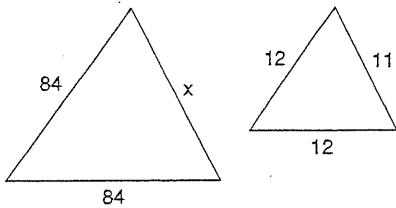
13)



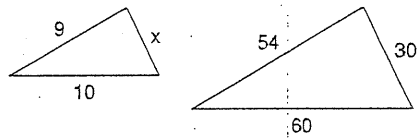
14)



15)



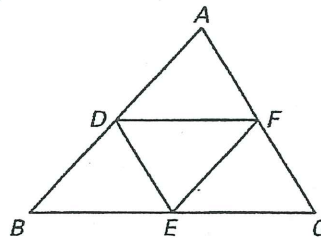
16)



# Practice A

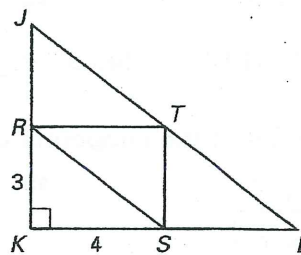
For use with pages 287–293

Use the diagram of  $\triangle ABC$  where  $D$ ,  $E$ , and  $F$  are the midpoints of the sides.



- $\overline{DE} \parallel$  ?
- $\overline{FE} \parallel$  ?
- If  $AB = 14$ , then  $EF =$  ?
- If  $BE = 8$ , then  $DF =$  ?
- If  $DE = 6$ , then  $AC =$  ?

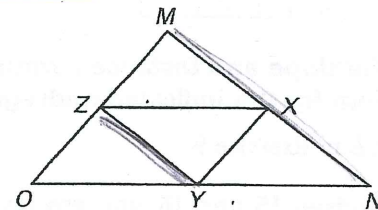
Use the diagram of  $\triangle JKL$  where  $R$ ,  $S$ , and  $T$  are the midpoints of the sides,  $RK = 3$ ,  $KS = 4$ , and  $JK \perp KL$ .



- Find the length of  $\overline{RS}$ .
- Find the length of  $\overline{JK}$ .
- Find the length of  $\overline{RT}$ .
- Find the perimeter of  $\triangle JKL$ .
- Name all of the right angles in the diagram.

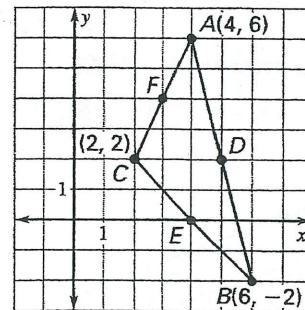
Use the diagram of  $\triangle MNO$  where  $X$ ,  $Y$ , and  $Z$  are the midpoints of the sides.

$2(YZ) = MN$



- If  $YZ = 3x + 1$ , and  $MN = 10x - 6$  then  $YZ =$  ?
- If  $YX = x - 1$ , and  $MO = 3x - 7$  then  $MO =$  ?
- If  $m\angle MON = 48^\circ$ , then  $m\angle MZX =$  ?
- If  $m\angle MXZ = 37^\circ$ , then  $m\angle MNO =$  ?
- Name a triangle that appears to be congruent to  $\triangle ZOY$ .

Use the graph shown.



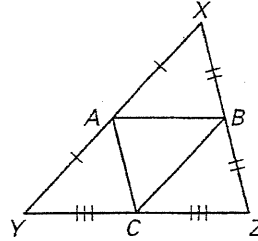
- Find the coordinates of the endpoints of each midsegment.
- Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{DF}$ .
- Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{FE}$ .
- Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{DE}$ .
- Determine the perimeter of  $\triangle ABC$  and  $\triangle DEF$ . What is the ratio of their perimeters,  $\triangle ABC$  to  $\triangle DEF$ ?

**Practice B**

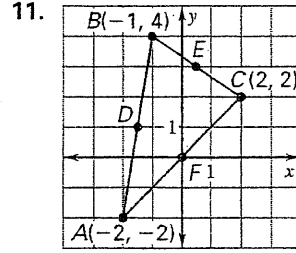
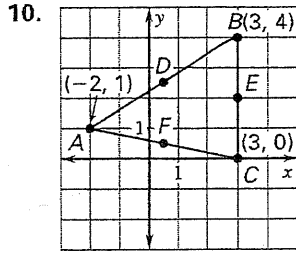
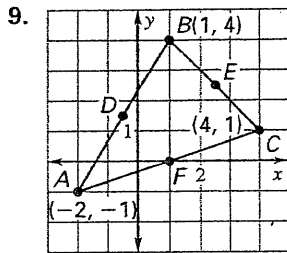
For use with pages 287–293

Use the diagram of  $\triangle XYZ$  where  $A$ ,  $B$ , and  $C$  are the midpoints of the sides.

1.  $\overline{AB} \parallel$  ?
2.  $\overline{XY} \parallel$  ?
3. If  $AC = 3$ , then  $XZ =$  ?
4. If  $YZ = 7$ , then  $AB =$  ?
5. If  $AC = 3m$ , then  $XZ =$  ?
6. If  $XY = m + 1$  and  $BC = m - 3$ , then  $XY =$  ?
7. If  $AC = m - 2$  and  $XZ = m + 4$ , then  $AC =$  ?
8. If  $BC = \frac{3}{4} AC$  and  $XZ = 8$ , then  $BC =$  ?



Find the coordinates of the endpoints of each midsegment.



Use the slope and Distance Formula to verify the Midsegment Theorem for the indicated midsegment.

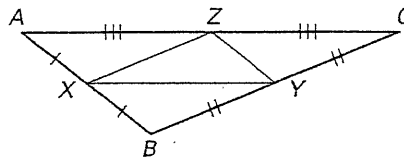
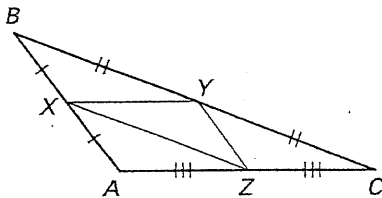
12.  $\overline{DE}$  in Exercise 9      13.  $\overline{DF}$  in Exercise 10      14.  $\overline{DE}$  in Exercise 11

In Exercises 15 and 16, you are given the midpoints of the sides of a triangle. Find the coordinates of the vertices of the triangle.

15.  $L(3, 2), M(1, 3), N(1, 1)$       16.  $L(3, 6), M(5, 5), N(2, 2)$

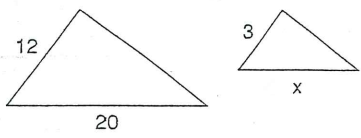
Find the perimeter of  $\triangle ABC$ .

17. Given:  $AX = 2, XY = 3, BC = 9$       18. Given:  $XZ = 5, ZY = 3, XY = 7$



Similar Figures

Each pair of figures is similar. Find the missing side.


1) 

$$\frac{3}{12} = \frac{x}{20}$$

$$\frac{1}{4} = \frac{x}{20}$$

$$4x = 20$$

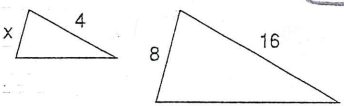
$$x = 5$$

2) 

$$\frac{1}{3} = \frac{x}{9}$$

$$3x = 9$$

$$x = 3$$

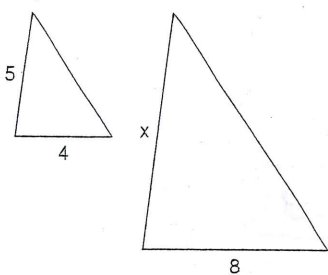
3) 

$$\frac{x}{8} = \frac{4}{16}$$

$$\frac{x}{8} = \frac{1}{4}$$

$$4x = 8$$

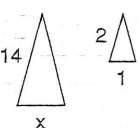
$$x = 2$$

4) 

$$\frac{x}{5} = \frac{8}{4}$$

$$\frac{x}{5} = \frac{2}{1}$$

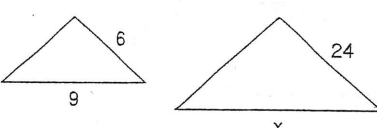
$$x = 10$$

5) 

$$\frac{1}{x} = \frac{2}{14}$$

$$\frac{1}{x} = \frac{1}{7}$$

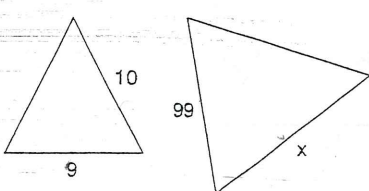
$$x = 7$$

6) 

$$\frac{x}{9} = \frac{24}{6}$$

$$\frac{x}{9} = \frac{4}{1}$$

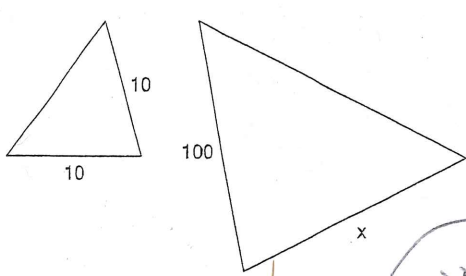
$$x = 36$$

7) 

$$\frac{9}{99} = \frac{10}{x}$$

$$\frac{1}{11} = \frac{10}{x}$$

$$x = 110$$

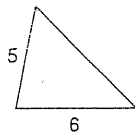
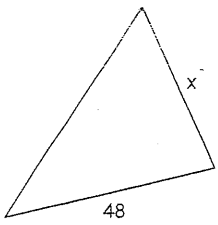
8) 

$$\frac{x}{10} = \frac{100}{10}$$

$$10x = 1000$$

$$x = 100$$

9)

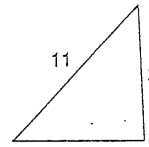
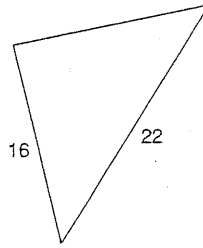


$$\frac{x}{5} = \frac{48}{6}$$

$$\frac{x}{5} = \frac{8}{1}$$

$$x = 40$$

10)



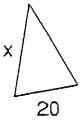
$$\frac{22}{11} = \frac{16}{x}$$

$$\frac{2}{1} = \frac{16}{x}$$

$$2x = 16$$

$$x = 8$$

11)

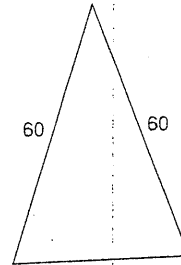
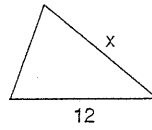


$$\frac{x}{20} = \frac{3}{3}$$

$$2x = 60$$

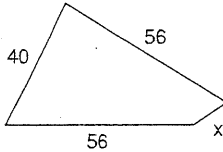
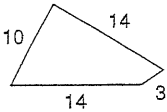
$$x = 30$$

12)



$$x = 12$$

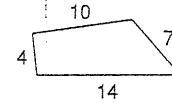
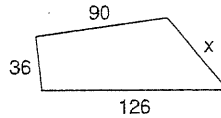
13)



$$\frac{10}{40} = \frac{3}{x}$$

$$\frac{1}{4} = \frac{3}{x} \quad x = 12$$

14)

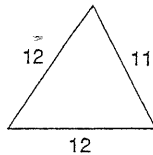
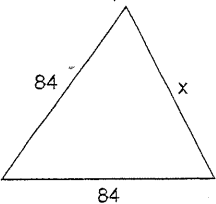


$$\frac{4}{36} = \frac{7}{x}$$

$$\frac{1}{9} = \frac{7}{x}$$

$$x = 63$$

15)

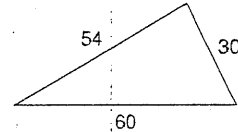
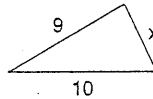


$$\frac{12}{84} = \frac{11}{x}$$

$$\frac{1}{7} = \frac{11}{x}$$

$$x = 77$$

16)



$$\frac{9}{54} = \frac{x}{30}$$

$$\frac{1}{6} = \frac{x}{30}$$

$$6x = 30$$

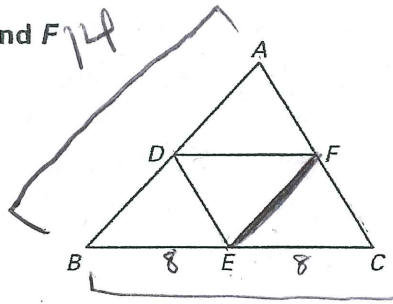
$$x = 5$$

**Practice A**

For use with pages 287-293

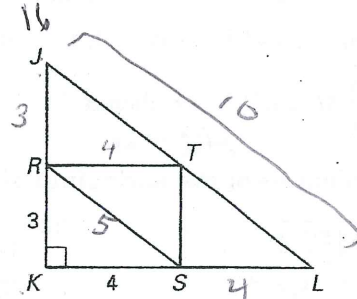
Use the diagram of  $\triangle ABC$  where  $D, E,$  and  $F$  are the midpoints of the sides.

1.  $\overline{DE} \parallel ?$  ~~AC~~ **AC**
2.  $\overline{FE} \parallel ?$  **AB**
3. If  $AB = 14$ , then  $EF = ?$  **7**
4. If  $BE = 8$ , then  $DF = ?$  **8**
5. If  $DE = 6$ , then  $AC = ?$  **12**



Use the diagram of  $\triangle JKL$  where  $R, S,$  and  $T$  are the midpoints of the sides,  $RK = 3$ ,  $KS = 4$ , and  $\overline{JK} \perp \overline{KL}$ .

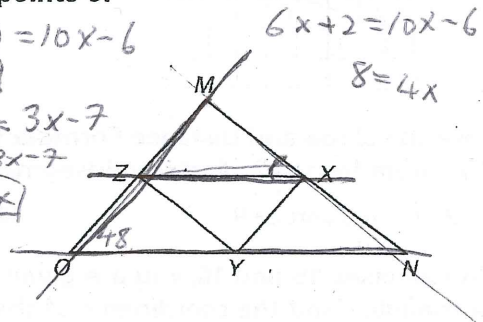
6. Find the length of  $\overline{RS}$ . **5**
7. Find the length of  $\overline{JK}$ . **6**
8. Find the length of  $\overline{RT}$ . **4**
9. Find the perimeter of  $\triangle JKL$ .  **$6 + 8 + 10 = 24$**
10. Name all of the right angles in the diagram.  **$\angle RTS, \angle JKL, \angle TSL, \angle JRT$**



**$2(YZ) = MN$**

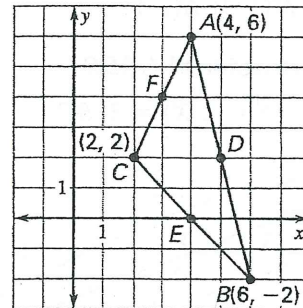
Use the diagram of  $\triangle MNO$  where  $X, Y,$  and  $Z$  are the midpoints of the sides.

11. If  $YZ = 3x + 1$ , and  $MN = 10x - 6$  then  $YZ = ?$   **$x = 2$**
12. If  $YX = x - 1$ , and  $MO = 3x - 7$  then  $MO = ?$   **$2(x-1) = 3x-7$**
13. If  $m\angle MON = 48^\circ$ , then  $m\angle MZX = ?$   **$48^\circ$**   **$2x-2 = 3x-7$**
14. If  $m\angle MXZ = 37^\circ$ , then  $m\angle MNO = ?$   **$37^\circ$**   **$5 = x$**
15. Name a triangle that appears to be congruent to  $\triangle ZOY$ .  **$\triangle MZX$**



Use the graph shown.

16. Find the coordinates of the endpoints of each midsegment.
17. Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{DF}$ .
18. Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{FE}$ .
19. Use the slope and the Distance Formula to verify that the Midsegment Theorem is true for  $\overline{DE}$ .
20. Determine the perimeter of  $\triangle ABC$  and  $\triangle DEF$ . What is the ratio of their perimeters,  $\triangle ABC$  to  $\triangle DEF$ ?



**Practice B**

For use with pages 287-293

6)  $2(BC) = XY$

$2(m-3) = m+1$   
 $2m-6 = m+1$

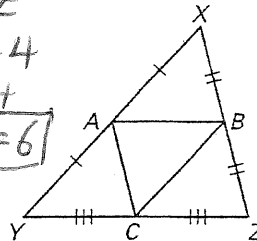
$m = 7$

$XY = 7+1 = 8$

7)  $2(AC) = XZ$

$2(m-2) = m+4$   
 $2m-4 = m+4$

$m = 8, AC = 6$



Use the diagram of  $\triangle XYZ$  where  $A, B,$  and  $C$  are the midpoints of the sides.

1.  $\overline{AB} \parallel ?$   $\underline{YZ}$

2.  $\overline{XY} \parallel ?$   $\underline{BC}$

3. If  $AC = 3$ , then  $XZ = ?$   $\underline{6}$

4. If  $YZ = 7$ , then  $AB = ?$   $\underline{3.5}$

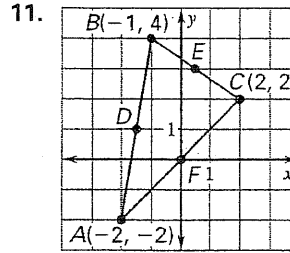
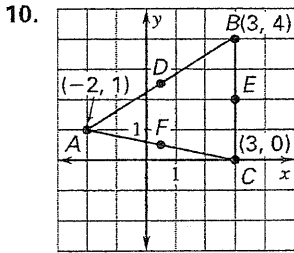
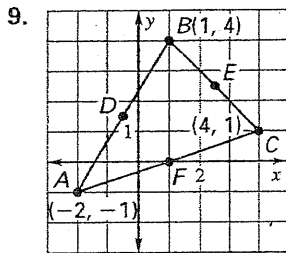
5. If  $AC = 3m$ , then  $XZ = ?$   $\underline{6m}$

6. If  $XY = m + 1$  and  $BC = m - 3$ , then  $XY = ?$

7. If  $AC = m - 2$  and  $XZ = m + 4$ , then  $AC = ?$

8. If  $BC = \frac{3}{4} AC$  and  $XZ = 8$ , then  $BC = ?$   $\underline{BC = \frac{3}{4}(4) = 3}$   
 $AC = 4$

Find the coordinates of the endpoints of each midsegment.



Use the slope and Distance Formula to verify the Midsegment Theorem for the indicated midsegment.

12.  $\overline{DE}$  in Exercise 9

13.  $\overline{DF}$  in Exercise 10

14.  $\overline{DE}$  in Exercise 11

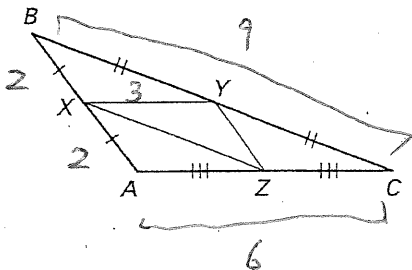
In Exercises 15 and 16, you are given the midpoints of the sides of a triangle. Find the coordinates of the vertices of the triangle.

15.  $L(3, 2), M(1, 3), N(1, 1)$

16.  $L(3, 6), M(5, 5), N(2, 2)$

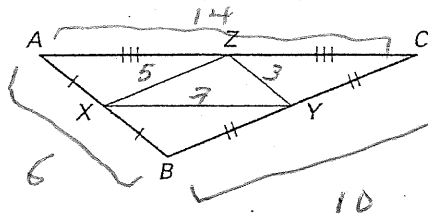
Find the perimeter of  $\triangle ABC$ .

17. Given:  $AX = 2, XY = 3, BC = 9$



$4 + 9 + 6 = 19$

18. Given:  $XZ = 5, ZY = 3, XY = 7$



$14 + 6 + 10 = 30$